

WHAT IS CLAIMED IS:

1. A balanced-unbalanced multiband filter module comprising three high-frequency switches each comprising a switching element, and two balanced-unbalanced bandpass filters having different passbands,

5 a first high-frequency switch comprising a first port connected to an unbalanced port of said module, a second port connected to an unbalanced port of a first balanced-unbalanced bandpass filter, and a third port connected to an unbalanced port of a second balanced-unbalanced bandpass filter;

10 a second high-frequency switch comprising a first port connected to a first balanced port of said module, a second port connected to a first balanced port of the first balanced-unbalanced bandpass filter, and a third port connected to a first balanced port of the second balanced-unbalanced bandpass filter; and

15 a third high-frequency switch comprising a first port connected to a second balanced port of said module, a second port connected to a second balanced port of the first balanced-unbalanced bandpass filter, and a third port connected to a second balanced port of the second balanced-unbalanced bandpass filter;

20 said first to third high-frequency switches being switched depending on a passing high-frequency signal, whereby a high-frequency signal input into the unbalanced port of said module is output from the first and second balanced ports, or high-frequency signals input into said first and second balanced ports are output from the unbalanced port of said module.

25 2. A balanced-unbalanced multiband filter module comprising two balanced-unbalanced bandpass filters having different passbands, and six phase shifters connected to said balanced-unbalanced bandpass filters,

a first phase shifter comprising a first port connected to an unbalanced

port of said module, and a second port connected to an unbalanced port of a first balanced-unbalanced bandpass filter;

a second phase shifter comprising a first port connected to the unbalanced port of said module, and a second port connected to an unbalanced port of a second balanced-unbalanced bandpass filter;

a third phase shifter comprising a first port connected to a first balanced port of the first balanced-unbalanced bandpass filter, and a second port connected to a first balanced port of said module;

a fourth phase shifter comprising a first port connected to a second balanced port of the first balanced-unbalanced bandpass filter, and a second port connected to a second balanced port of said module;

a fifth phase shifter comprising a first port connected to a first balanced port of the second balanced-unbalanced bandpass filter, and a second port connected to the first balanced port of said module; and

a sixth phase shifter comprising a first port connected to a second balanced port of the second balanced-unbalanced bandpass filter, and a second port connected to the second balanced port of said module;

whereby a high-frequency signal input into the unbalanced port of said module is output from said first and second balanced ports, or high-frequency signals input into said first and second balanced ports are output from the unbalanced port of said module.

3. A balanced-unbalanced multiband filter module comprising a high-frequency switch comprising a switching element, two balanced-unbalanced bandpass filters having different passbands, and four phase shifters connected to said balanced-unbalanced bandpass filters,

said high-frequency switch comprising a first port connected to an unbalanced port of said module, a second port connected to an unbalanced port of a first balanced-unbalanced bandpass filter, and a third port connected

to an unbalanced port of a second balanced-unbalanced bandpass filter;

a first phase shifter comprising a first port connected to a first balanced port of the first balanced-unbalanced bandpass filter, and a second port connected to a first balanced port of said module;

5 a second phase shifter comprising a first port connected to a second balanced port of the first balanced-unbalanced bandpass filter, and a second port connected to a second balanced port of said module;

a third phase shifter comprising a first port connected to a first balanced port of the second balanced-unbalanced bandpass filter, and a
10 second port connected to the first balanced port of said module; and

a fourth phase shifter comprising a first port connected to a second balanced port of the second balanced-unbalanced bandpass filter, and a second port connected to the second balanced port of said module;

said first high-frequency switch being switched depending on a passing
15 high-frequency signal, whereby a high-frequency signal input into the unbalanced port of said module is output from the first and second balanced ports, or high-frequency signals input into said first and second balanced ports are output from the unbalanced port of said module.

4. A balanced-unbalanced multiband filter module comprising two
20 high-frequency switches each comprising a switching element, two balanced-unbalanced bandpass filters having different passbands, and two phase shifters connected to said balanced-unbalanced bandpass filters,

a first phase shifter comprising a first port connected to an unbalanced port of said module, and a second port connected to an unbalanced port of a
25 first balanced-unbalanced bandpass filter;

a second phase shifter comprising a first port connected to the unbalanced port of said module, and a second port connected to an unbalanced port of a second balanced-unbalanced bandpass filter;

a first high-frequency switch comprising a first port connected to a first balanced port of said module, a second port connected to a first balanced port of the first balanced-unbalanced bandpass filter, and a third port connected to a first balanced port of the second balanced-unbalanced bandpass filter;

a second high-frequency switch comprising a first port connected to a second balanced port of said module, a second port connected to a second balanced port of the first balanced-unbalanced bandpass filter, and a third port connected to a second balanced port of the second

balanced-unbalanced bandpass filter;

said first and second high-frequency switches being switched depending on a passing high-frequency signal, whereby a high-frequency signal input into the unbalanced port of said module is output from the first and second balanced ports, or high-frequency signals input into said first and second balanced ports are output from the unbalanced port of said module.

5. The balanced-unbalanced multiband filter module according to any one of claims 1-4, wherein said first and second balanced-unbalanced bandpass filters have different input impedance Z_i and output impedance Z_o , thereby exhibiting an impedance conversion function.

6. The balanced-unbalanced multiband filter module according to any one of claims 1-5, wherein said balanced-unbalanced bandpass filter is a SAW filter or an FBAR filter.

7. The balanced-unbalanced multiband filter module according to any one of claims 1-6, wherein it is constituted by a laminate of pluralities of dielectric layers having electrode patterns, transmission lines constituting said phase shifters and said high-frequency switches being formed by said electrode patterns, and switching elements constituting said high-frequency switches and said balanced-unbalanced bandpass filters being mounted onto

said laminate.

8. A multiband mobile phone comprising a high-frequency circuit having the balanced-unbalanced multiband filter module recited in any one of claims 1-7.